

Mathematics 1550H – Introduction to probability

TRENT UNIVERSITY, Winter 2018

Assignment # 7

An expected value and variance

Due on Friday, 9 March.

Consider the random variable X with density function $f(x) = \begin{cases} 0 & x < 1 \\ 2x^{-3} & x \geq 1 \end{cases}$.

1. Determine whether $f(x)$ is a valid probability density. [4]
2. Compute the expected value, $E(X)$, and variance, $V(X)$, of X . [6]

There are in this world optimists who feel that any symbol that starts off with an integral sign must necessarily denote something that will have every property that they should like an integral to possess. This is of course quite annoying to us rigorous mathematicians; what is even more annoying is that by doing so they often come up with the right answer.

E.J. Mcshane

Some of the greatest advances in mathematics have been due to the invention of symbols, which it afterwards became necessary to explain; from the minus sign proceeded the whole theory of negative quantities.

Aldous Huxley

Everyone knows what a curve is, until he has studied enough mathematics to become confused through the countless number of possible exceptions.

Felix Klein

[To a physicist:] Young man, in mathematics you don't understand things. You just get used to them.

John von Neumann

[About John von Neumann:] The only student of mine I was ever intimidated by. He was so quick. There was a seminar for advanced students in Zürich that I was teaching and von Neumann was in the class. I came to a certain theorem, and I said it is not proved and it may be difficult. Von Neumann didn't say anything but after five minutes he raised his hand. When I called on him he went to the blackboard and proceeded to write down the proof. After that I was afraid of von Neumann.

George Pólya